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ABSTRACT

With the assistance of the Canadian Captioning Development Agency, TVOntario has undertaken to determine the efficacy of applying closed-captioned television to the needs of adult learners who are not hearing impaired. In this research study, actual and potential applications of closed-captioned television for hearing audiences in Canada, the United States, the United Kingdom, Europe, and Australia were explored in order to provide a context to guide development in this area. Following a description of captioning technology and a discussion of the current commitment of Canadian broadcasters to captioned television, the report provides a review of experimental research studies that tested the use of closed-captioned television with adult students of English as a Second Language and literacy, as well as with learning disabled adults. The results of these studies are discussed in terms of their implications for the development of captioned television for adult learners in Ontario. The adult learner markets for closed-captioned television in Ontario are described in detail, as are the programs currently available to these learners. Issues are raised concerning the learning contexts that are best suited to learning with closed captions, and suggestions are made as to the types of programs and captioning methods that are most conducive to learning. The paper concludes with recommendations for the next phase of research--to conduct a pilot test of the use of captioned video in various classroom learning contexts and with learners of varying capabilities. (13 references) (Author/DL)

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88-3

The Potential of Captioned Television For Adult Learners

Audrey Mehler

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TVOntario

Planning and Development Research
Planification et recherche en développement

Working Paper 88-3

THE POTENTIAL OF CAPTIONED TELEVISION FOR ADULT LEARNERS

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With the assistance of
The Canadian Captioning Development Agency

April 1988

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SUMMARY

With the assistance of the Canadian Captioning Development Agency, TVOntario has undertaken to determine the efficacy of applying closed-captioned television to the needs of adult learners who are not hearing impaired. In this research study, actual and potential applications of closed-captioned television for hearing audiences in Canada, the United States, the United Kingdom, Europe, and Australia were explored in order to provide a context to guide development in this area.

Following a description of captioning technology and a discussion of the current commitment of Canadian broadcasters to captioned television, the report provides a review of experimental research studies that tested the use of closed-captioned television with adult students of English as a Second Language and Literacy, as well as with learning disabled adults. The results of these studies, along with perspectives on captioned television from providers of adult literacy and language programmes, are discussed in terms of their implications for the development of captioned television for adult learners in Ontario. The adult learner markets for closed-captioned television in Ontario are described in detail, as are the programmes currently available to these learners.

Issues are raised concerning the learning contexts that are best suited to learning with closed captions, and suggestions are made as to the types of programmes and captioning methods that are most conducive to learning. The paper concludes with recommendations for the next phase of research--to conduct a pilot test of the use of captioned video in various classroom learning contexts and with learners of varying capabilities. Development of print materials to accompany captioned television programmes is also advised.

Closed-captioned television is felt by many to be an effective learning tool. While its current application is limited primarily to the hearing impaired, it is hoped that, by offering more captioned programming and raising audience awareness as to the availability of such programming as a learning resource, its utilization will be broadened.

THE POTENTIAL OF CAPTIONED TELEVISION FOR ADULT LEARNERS

INTRODUCTION

This report examines the possibilities for TVOntario to make available, through broadcast and nonbroadcast, its closed-captioned television programmes for use by adult learners other than those who are deaf or hearing impaired. Research was undertaken to determine whether closed captioning, the audience for which is now largely limited to hearing impaired viewers, holds potential as an effective teaching tool for adult learners, particularly those in need of skills upgrading in the areas of reading, comprehension, vocabulary, and general language proficiency.

During the course of this research, many people were contacted, including representatives of the captioning services industry in Canada, the U.S., and Australia, providers of literacy and language training programmes, representatives of provincial government ministries which are responsible for sponsoring literacy and language training programmes, and educational broadcasters in Canada, the U.S., Britain, and Sweden. Their views form the basis of the recommendations made in this report. In the first section, some background information related to this project is given, including a description of closed-captioned technology. The second section looks at education, with an overview of recent research and applications of closed-captioned television for hearing audiences, followed by a section on potential users of captioned television in Ontario. Then, a discussion of the various perspectives on the appropriateness and effectiveness of closed-captioned television for adult learning are presented.

The final section contains recommendations for how TVOntario might proceed to make closed-captioned programmes available to hearing adult audiences.

CAPTIONED TELEVISION

Closed-captioned television was introduced in Canada in 1981 to facilitate television viewing and enjoyment by the hearing impaired. The captions are encoded into the video signal of many Canadian and American television programmes, and a decoder is required to enable the viewer to view the captions along with the television programme. Approximately 150 hours of closed-captioned programmes are available in Toronto each week.

Until quite recently, only decoders imported from the United States were available in Canada; these cost approximately $400 and were often difficult to obtain. Now, Bridge Integrated Technologies manufactures a cable-ready decoder (i.e., for use only with televisions that are wired for cable) in Ontario which costs about $250. The number of decoders in use in Canada is expected to increase with the current availability of a cheaper, Canadian-made decoder.

A survey undertaken in the United States in 1986 indicated that there were 110,000 decoders in use nationally. It is difficult to obtain an exact figure for the number of caption decoders in use in Canada. The Ministry of Transport and Communications estimated in 1985 that 10,000 decoders were in use in Ontario. In a 1983 survey of the hard-of-hearing population in the U.S. conducted by the National Captioning Institute, only half of the respondents had ever heard of decoders, and only 21% had ever seen them in operation. The researchers concluded that further education concerning closed-captioned television was required in order to increase decoder penetration among the hearing impaired. [1]

The Technology

Captions are lines of text which may be inserted into line 21of the vertical blanking interval of the television signal, or they can be transmitted separately yet concurrently with the television via teletext, as is done in Britain and Australia. Captions can be transmitted openly, whereby they are visible to everyone watching the programme, or closed, in which case they cannot be seen unless the viewer's television set in equipped with a special decoder. Captions can be a verbatim transcription of the audio script, a condensed version, a simplified version, or supplementary to the audio script. The speed with which captions appear on the television screen can be adjusted at the point of captioning, and programmes can be captioned in more than one language. Viewers select their language by tuning into the appropriate channel on their decoders.

Captions can be encoded into pre-recorded television programmes or created simultaneously with the transmission of a programme, i.e., real-time captioning. Real-time captioning employs a technology similar to that used for court reporting; the operator is connected to the television studio via a computer modem, and the captions are encoded instantaneously in to the television signal. Real-time captioning is used for many evening news broadcasts and special live broadcasts, such as the ABC coverage of the 1988 Calgary Winter

Olympics. Captioning charges currently range between $1,600 and $1,800 per programme hour for post-production captioning. The rate varies according to the status of the broadcaster (educational broadcasters pay less for captioning), and the time of year (off-season is cheaper).

The Canadian Captioning Development Agency

The Canadian Captioning Development Agency (CCDA) was established as a private non-profit agency in 1981. Its objective is to serve the hearing-impaired community in Canada by providing captioning services to broadcasters and advertisers so as to ensure that more captioned television programmes and television commercials are made available. CCDA, along with other providers of captioning services such as WGBH (the PBS affiliate in Boston) and the National Captioning Institute (the U.S. equivalent of CCDA), feels that closed-captioned television is an effective learning tool for language acquisition and literacy training. CCDA believes that Canadian research into this area is necessary in order to encourage the development of closed-captioned programming as an educational technology for hearing audiences. Once evidence is established as to the effectiveness of closed-captioned television for learning, and the demand for such resources is demonstrated, more broadcasters might be convinced to provide increased captioned programming.

CCDA hopes that if TVOntario proceeds to package its captioned programmes specifically for particular learner groups, such as those learning literacy or English or French as a second language, and then launches a promotional campaign to inform potentially interested viewers of the existence and availability of the programmes, these viewers might be encouraged to take advantage of the captioned programming available from TVO, as well as that of other broadcasters. The overall audience for closed-captioned television would then extend to hearing populations and would spur the development of more captioned programming.

Other Captioning Services

Besides CCDA, there are other independent captioning agencies in Canada, such as the National Captioning Centre in Toronto and Centre nationale du sous-titrage (PST) Inc. in Montreal. These agencies offer captioning at prices similar to those of the CCDA.

The National Captioning Institute (NCI) was established in the U.S. in 1979 as a private, non-profit agency to further the development of closed-captioned television. NCI is responsible for most of the captioning in the U.S., including that of NBC, ABC, half of all captioned PBS programmes, Fox Broadcasting Company, cable suppliers, syndicators, and home video producers. The Caption Centre at WGBH in Boston provides captioning services for half of all PBS programmes captioned and a large portion of CBS programmes.

NCI has developed home decoders (Telecaption and Telecaption II) and sponsors a great deal of research into new markets for captioning services. According to the consumer market research department at NCI, there has been

a large increase in the numbers of Asian immigrants using closed-captioned television to learn English at home. Sales of NCI's decoder, Telecaption II, to Chinese and Korean cultural groups have increased dramatically in the past year.

Canadian Broadcasters and Captioning

During March 1988, TVOntario English Network and la chaîne française together broadcast a total of about 7.5 hours of closed-captioned programming per week. This amount is expected to increase in the upcoming seasons. For the past two years, TVO has received substantial grants, e.g., $181,000 for fiscal year 1987-88 and $190,000 for fiscal year 1988-89, from the Ministry of Communications and Culture to cover the costs of captioning. TVO has contracted the CCDA to caption 112 hours of TVO programming in 1988-89. As well, TVO requires its coproducers to apply to Telefilm for funding to pay for the captioning of new coproductions. A portion of the Telefilm Broadcast Fund (about $500,000) has been made available for captioning.

Selected TVO Schools programming is open-captioned for hearing-impaired students by the Sir James Whitney School, using a character generator. The tapes--with open captions--are then made available to Ontario school boards through the TVOntario video distribution program, VIPS. TVO is planning to offer utilization training for teachers in the use of open-captioned television programmes. For the past four years, hearing-impaired students have been integrated into mainstream schools in Ontario. Closed-captioned television is felt to be an effective way to present lessons to both hearing and hearing-impaired students.

The CBC and Radio Canada receive $1.2 million annually to help pay for captioning of their programmes (CBC receives $.5 million and Radio Canada receives $.7 million). The CBC and Radio Canada have in-house news captioning services for captioning The National and Telejournal. CBC and Radio Canada currently offer about 15 hours each of closed-captioned programmes per week. The CBC policy requires that all programmes produced by independent producers be delivered with captions encoded onto the master tape. Five hours per week of CBC's captioned programming comes from the United States.

CTV has acquired Newscap, the CCDA's news captioning system (the system costs $750 and is used with an IBM-XT or compatible computer). CTV currently broadcasts nearly 15 hours of closed-captioned programming per week including Canadian and American programmes. CITY-TV offers about four hours of closed-captioned television per week. Global broadcasts about 16.5 hours of closed-captioned programmes per week, mainly from the U.S. networks.

The broadcast rights to a captioned version of an American program are obtained separately from the rights to the program itself. Negotiations for these rights are done directly with the U.S. captioning agency. The floppy disk containing the captions to a network program are available to Canadians for approximately 10% of the cost of captioning that program (at present, about

$250-$300 U.S.).[2] The captions are then encoded onto a videotape of the U.S. programme by the Canadian broadcaster.

Radio-Québec captions two of its weekly programmes, A Plein Temps and Ciné-Cinéma, for a total of 2.5 hours per week of closed-captioned television. Radio-Québec has no plans in the near future to augment its captioned programmes due to a lack of funding.

ACCESS Alberta does not caption its programming at the present time because its budget does not allow for captioning. They are exploring the possibility of acquiring their own captioning equipment or employing CCDA to caption their programmes. ACCESS does broadcast captioned versions of TVOntario programmes and some American programmes, such as Nova and National Geographic.

The Knowledge Network of the West does not caption its programmes, nor those that it acquires from other broadcasters and producers. KNOW makes the effort to obtain captioned versions of programmes when they are available, but does not have the money to pay for captioning.

Skyline Cable in Ottawa transmits a selection of decoded, i.e., open, captioned programmes on one of their spare channels. They have reported receiving telephone calls from at least 40 ESL and grade school students who stated that the service was of substantial benefit to their learning.

EDUCATIONAL APPLICATIONS

The United States

For the most part, Canadian audiences for closed-captioned television are currently limited to the hearing impaired, mainly because other applications have not yet been developedor popularized. In the United States, however, closed-captioned television has been used, largely on an experimental basis, in different learning situations for the past seven years. Closed-captioned television is used in the U.S. to teach English as a Second Language (ESL) and literacy to both deaf and hearing children and adults.

The English as a Second Language programme at Harvard University implements closed-captioned television for adult learners of diverse backgrounds in many different learning situations, including classrooms, small groups, independent language labs, community settings, and at home. Different courses have been designed for new immigrants, refugees, and diplomats in both the intensive and extension programmes.

In 1983, researchers in the ESL programme at Harvard conducted an extensive study of the effectiveness of closed-captioned television for 500 adult ESL students. Students were tested both before and after viewing television programmes with and without closed captions. The findings revealed significant improvement in reading and comprehension for all students who viewed the captions. The researchers strongly recommended that ESL learners be made aware of closed-caption television as a valuable resource through the use of decoders in the classroom.

In 1985, the researchers at Harvard were contracted to develop an ESL learning package for at-home learners in Japan. Twenty half-hour tapes and a viewer's guide were produced at Harvard, and the captioning was done by WGBH, the PBS affiliate in Boston. The tapes consisted of short video segments used to illustrate principles of the English language. Eighty percent of the material used was from available footage such as The Jane Fonda Workout and popular films, and 20% of the material was produced at Harvard. Almost all of the video material used in these tapes was dramatic as opposed to pedagogic, the rationale being that drama is of great interest and highly motivating to learners and the dramatic context facilitates comprehension of the captioned text.

The use of closed-captioned television to teach literacy to adults has been investigated by researchers from the Universities of Pittsburgh and Maryland with positive results. The study looked at the effects of using closed-captioned television on students' sight vocabulary and fluency as compared to the effects of reading printed text material. The attitudes of students towards using closed-captioned television as a tool for reading instruction were also examined. Three treatments were applied to 24 students attending an adult literacy program: closed-captioned television viewing with instruction, script with instruction, and closed-captioned television viewing without instruction. Segments from 3-2-1 Contact, an educational science programme produced by the Children's Television Workshop for upper elementary school students, were used to

generate lesson scripts for the three different groups. All three approaches were equally effective in helping students learn words, as measured by pre- and post-tests for word recognition. However, with or without instruction, those students in the closed-captioned groups scored 95% with greater frequency than those in the script group. In an attitude survey taken after the final session of the test, 100% of students in the closed-captioned groups indicated that they enjoyed working in this medium. A majority of the students in the closed-captioned groups indicated that the lessons helped them to learn new information, to pronounce new words, and to learn the meaning of new words. The researchers suggested that captioned television be used as a supplementary medium in adult literacy programmes and by adult learners independently at home.

Another study tested the effects of closed-captioned television on the reading performance of learning disabled students. Seventy-seven students from four Maryland public schools were each subject to one of four different treatment conditions: captioned TV with sound, captioned TV without sound, conventional television, and printed text of captions (no television). Following the treatment, students were given a word recognition test, a cloze task (i.e., reading a text with deletions and filling in the missing words), and comprehension questions. The captioned-TV-with-sound group did better than the other groups on all tests. Conventional television was also found to stimulate better results.

According to the research report, these findings support the hypothesis that both conventional TV and captioned TV with sound enhance comprehension for learning disabled students. The audio does not appear to interfere with young children's processing of the captions. Rather, the report states that the findings support the theory that simultaneous processing enhances learning, and the researchers conclude that the addition of captions to conventional TV may be a significant factor in developing and enhancing reading skills of young children.

The United Kingdom

After speaking with representatives of the BBC, it would seem that the BBC is not using closed captioning as part of its programmes aimed at adult learners. The BBC captions a large portion of its programmes for the hearing impaired, but, according to these sources, these programmes have not been redirected towards the adult literacy or ESL markets. Some open captions and graphics are used occasionally in the BBC's foreign language programmes, e.g., Discovering Portuguese, but the whole programme is not closed captioned. Rather, a dialogue might be shown twice, with the text of the dialogue appearing on the screen during the second showing. Or, if a question is asked, the text of the question might appear in full screen. The BBC rarely uses on-screen print because it is felt to distract the viewer's attention from the speaker's words and body movement. Rather, print graphics are used as review of and supplementary to the visual and aural messages.

Channel Four and the ITV Network transmit 25 hours of captioned programmes per week for use by hearing impaired audiences. According to Oracle Teletext Limited, the captioning agency for ITV and Channel Four, these programmes are not being applied to adult learning situations. However, an inexpensive

adaptor has been developed at the University of Southampton to allow teachers of deaf children to caption their own programmes to accommodate the reading levels of individual students. This type of technology could certainly be applied to other areas of education.

Europe

Because of the high percentage of foreign, i.e., North American, programming imported into most European countries, nearly every country in Europe provides captioning services for both general and hearing impaired audiences. As a matter of course, imported English-language programmes are subtitled for audiences in France, the Netherlands, Scandinavia, Yugoslavia and other countries.

The Educational Broadcasting Company of Sweden commissioned a research study to test the value of subtitling English-language school programmes in English. Five different treatments were used to determine whether subtitling is an effective learning tool and which subtitling technique is most effective. These treatments included no subtitles; subtitles which were verbatim transcriptions of the spoken text (three lines of captions on-screen at once); near-verbatim transcription of the spoken text (two lines of captions on-screen at once); supportive subtitles, i.e., only the main points were subtitled; and simplified subtitles, i.e., fewer words used in captions, captions left onscreen longer to facilitate reading. Students found the subtitles helpful, and the near-verbatim subtitles shown on-screen two lines at a time proved most effective. Researchers found that if the language of the captions was too difficult, other learning aids were necessary.

Australia

The Australian Caption Centre is a non-profit captioning agency in Australia. The Australian Caption Centre is very committed to making captioned television available for educational use by hearing populations. The Centre has offered teacher workshops to train teachers in the effective use of captioned television in the classroom, and is in the process of establishing a teacher's guide to the use of captioned television. They are preparing to mount a research programme to document the current educational uses of captioned programmes and the results.

Australia offers an integrated educational system whereby deaf and hearing-impaired children attend school with hearing children. This integrated system has helped to bring to the attention of teachers of hearing children the effectiveness of captioned television for general learning. The Australian Broadcasting Corporation offers daytime transmission of closed-captioned educational programming for children and adults. This programming is used in the schools, which are equipped with decoders and VCRs (there is an 80% penetration of VCRs in Australia). Teachers prefer to use videotapes rather than over-the-air-broadcasts so that they are not dependent on broadcast schedules and so that they can plan lessons around the videotapes, stopping and

reviewing where necessary, and pacing the lesson in accordance with the needs of their students.

A major initiative is now underway to distribute open-captioned educational, informational, and entertainment videos through the public library system. It is hoped that wider accessibility to captioned videos will lead to a heightening of public awareness and increased use of captioned TV by individuals, groups, and providers of adult education.

The use of captioned television programmes for adult education is just beginning in Australia. Closed-captioned television has not yet been applied in adult literacy or ESL programmes, however, government offices and industry are using open-captioned instructional programmes for vocational training, professional development, occupational health and safety, and career planning.

POTENTIAL FOR CLOSED-CAPTIONED TELEVISION IN ONTARIO

From the foregoing review of research and applications, it seems that closed-captioned television programmes have been used effectively for hearing impaired, deaf, and learning disabled audiences, and in the teaching of literacy and English as a Second Language. It is now important to look at the size of each of these groups within Ontario in order to determine the potential markets for TVOntario's closed-captioned programming.

The Deaf

Deafness is defined on a continuum ranging from mild hearing loss, which requires no hearing aid, to the profoundly deaf. Somewhere in between are those people with some hearing loss who could use a hearing aid. In the preliminary estimate of the 1987 Post-Censual Survey, Statistics Canada estimates that .9% or 83,000 people in Ontario are profoundly deaf, while 6% or 553,000 people in Ontario suffer from some hearing loss. With the increasing proportion of the population who are over 65, an increase is expected in the percentage of people who are hearing impaired.

A large portion of the hearing impaired population in Ontario currently own decoders. The expense of the decoder may be a factor in limiting access for some of the hearing impaired population. For many people with mild hearing loss, the use of a standard hearing aid improves their enjoyment of television. The CCDA has suggested that, as with the early introduction of television in the 1950s, a small group of hearing impaired people might gather regularly to watch television at the home of someone who owns a decoder. The availability of a cheaper, Canadian-manufactured decoder, more captioned programming, and heightened consumer awareness through informational campaigns could allow even more people access to captioned television programmes.

The Learning Disabled

The Ontario Learning Disabilities Association defines a learning disabled person as one with average or above average intelligence who, because of a neurological problem that interferes with his or her ability to process information, is unable to perform to his or her potential. Learning disabled persons are classified as such through psychological assessment, a costly process not covered by the Ontario Health Insurance Plan. Ten percent of the population in Ontario is thought to have learning disabilities; 75% of them are male. The Ontario Learning Disabilities Association offers counseling and advocacy for adults who are learning disabled, as well as providing training for literacy tutors and teachers of Adult Basic Education to identify and deal with the learning disabled. According to the Executive Director, captioned television programming geared towards adults and providing general as well as applied information could be used effectively by the learning disabled community in Ontario.

Literacy and English as a Second Language Programmes

Literacy has been defined as the ability to use printed and written information to function in society. [3] According to a national survey conducted by Southam, Inc. during May-June 1987, there are 1,600,000 illiterates in Ontario. In Ontario, adult literacy training programmes are offered by community groups, the Ontario Ministry of Skills Development (which funds basic literacy training and workplace literacy training), and the Ontario Ministry of Education (which funds continuing education programmes through the school boards and community colleges). There are currently about 180 community-based literacy training programmes for native, francophone, and physically disabled learners. Community-based literacy programmes generally use a one-on-one approach in which each learner is assigned a tutor to guide him or her through the learning process. Depending on the size of the programme and the length of time it's been in operation, the number of tutor-learner pairs can range from 10 in the very small or very new programme to 100 in a well-established programme in a large city. Now that literacy programmes are filled to capacity and little funding or staff is available for expansion, small group literacy training is being considered to accommodate the needs of more learners.

The Ontario Ministry of Education (MOE) sponsors Adult Basic Education through 60 school boards in Ontario. This includes classroom courses in basic literacy and numeracy, which enrolled 18,300 in 1986; English or French as a Second Language, which enrolled 58,250 in 1986 (mostly in English); and citizenship and language (for more advanced students), which enrolled 5,850 in 1986. According to an official at the Ministry of Education, there is a trend toward increasing enrollments in basic literacy courses as more adults are feeling increasingly comfortable admitting that they cannot read, or that they require skills upgrading. During 1985-86, there was an 18% increase in the numbers of adults enrolled in MOE's continuing education programmes.

The Independent Learning Centre (ILC) of the MOE offers adult basic education packages for the at-home learner. In 1987, 1,000 adults were enrolled in the ILC literacy programme, 1,500 in the Grade 9 literacy upgrading programme, and approximately 500 in the ESL programme. The ILC at-home learning packages include print and audiotape materials and access to tutors by telephone. Occasionally learners have difficulty accessing audiotape players and access to videotape players could also be a major problem. In a 1988 survey of 300 students enrolled in ILC's self-directed basic literacy and ESL courses, less than 12 reported that they owned VCRs.

The Ontario Ministry of Skills Development offers work-related basic skills programmes through community colleges throughout the province, and basic skills in the workplace programmes through private employers. These programmes incorporate literacy and second language training as they relate to the workplace. Approximately 16,000 people participate in these programmes per year.

DISCUSSION

Perspectives of the Captioning Industry

As mentioned earlier, the CCDA is very supportive of closed-captioned television as a valuable learning tool for anyone learning to read, including preschool children, children in school, and adults. This is based on research that has shown that audio and visual cues reinforce the written text and facilitate comprehension. The National Captioning Institute extends the potential of captioned television to include those who wish to learn English. They have found that television is a highly motivating medium, providing a visual experience readily understood by all nationalities. When the visuals are supplemented with captions, the ESL student is able to make the association between the video, audio, and English captions.

The speed with which captions appear on the television screen is an important consideration when programming for new readers. The standard speed used by captioning agencies is 120 words per minute. Spokespersons from the Caption Centre at WGBH in Boston stress the importance of tailoring the wording, speed, and density of captions to fit the reading and language capabilities of the viewers. They also advise that captioned television be viewed in the proper context to facilitate learning, i.e., with a VCR to allow for repeating and pausing, and with accompanying print materials.

Perspectives of ESL Providers

The views of ESL providers on the potential effectiveness of closed-captioned television for language learning were for the most part positive, yet guarded. Karen Price at the Harvard University Program for ESL was very enthusiastic about the potential of closed-captioned television, provided it is applied effectively. For example, more advanced learners can absorb captions at a faster pace and greater density than can beginners. Simple or sophisticated visuals can be used, depending upon the proficiency of the intended audience. Price found that the degree of viewer preference for the video segments used played a large role in the effectiveness of the segments. Situation comedies, drama, and popular films seem to be most appealing. Short, i.e., two-to-three minute, segments of captioned television are more easily applied to learning situations than are entire 30- or 60-minute programmes. Price and her colleague, Anne Dow, both indicated that little formative evaluation has been done to determine the implications for and effects on learning brought about by the application of closed-captioned television.

One of the developers of the upcoming TVOntario ESL series, Language Lab, feels that the captions on the television screen might distract the viewer from the visual cues that are used in language training to communicate ideas. He feels that it is asking too much of the adult beginning learner at home to process audio, video, and textual information. In his opinion, closed-captioned television programmes could be useful as a learning tool for more advanced learners in the classroom setting, i.e., with instructor intervention. Language

Lab is a series of 24 half-hour programmes designed as an independent learning package complete with audiotapes and print materials. The programme will incorporate printed graphics to illustrate particular grammatical principles and usages (much like the BBC model). At this point, there are no plans to caption the audio script.

An Ontario, educator associated with a major distance eudcation literacy initiative, is responsive to the prospect of closed-captioned television, as long as the proper venicle is chosen. This would entail short programmes or segments that use simple, colloquial language, accompanied by print materials such as a tutor's guide and learner's guide. This educator feels these programmes should be made available on tape to community groups, schools, libraries, and at-home learners. Tutor training is imperative to the effective application of closed-captioned television for learning, as is a good promotional campaign to get the word out that these programmes are available to potential learners. Adult learners are desperate for information regarding raising children, families, health issues, caring for the body, etc., and so closed-captioned programmes on these topics (of which TVO has produced several) would be most effective.

The coordinator of a large adult basic education program in British Columbia is also enthusiastic about the prospect of using closed-captioned television programmes in ESL programmes, as long as the captions are clear and the language is adjusted to match different levels of proficiency. The necessity of supplementing any captioned television programmes with print materials was emphasized.

Perspectives of Literacy Programme Providers

The literacy providers interviewed seemed more hesitant than their ESL counterparts when approached with the prospect of employing closed-captioned television in literacy programmes. Those who work in community-run adult literacy programmes particularly feel quite strongly that the inability of many adults to read can be traced to basic difficulties with conventional teaching/learning methods, and that the imposition of a sophisticated technology may intimidate them. These adults need special handling: they are often embarrassed about their "handicap," to the point where it is extremely difficult for them to admit publicly that they cannot read, and once they do seek help, they require a very special, non-threatening learning situation in order to feel comfortable. Literacy providers have found that a one-to-one tutor/learner situation works best, using reading materials created either by the learner him/herself, or by another learner in a similar situation. Reading curriculum and materials are usually tailored to the needs of each individual student.

The literacy providers expressed a need for more learning materials for literacy training, and thought that closed-captioned television might be an effective tool for the more advanced literacy student, one who feels comfortable reading and could follow a programme on his/her own, as well as with a tutor. The importance of human contact and human support was stressed, as well as that of designing curriculum to meet the needs of individual learners. The pacing of the dialogue and the complexity of the vocabulary and sentence structure would have to be adjusted to align with the abilities of the learner. Given the added

difficulty of reading from a video screen, the print size and formats best suited to the needs of these learners would have to be considered as well. Ideally, programmes would be specially produced for literacy learners at different levels of proficiency.

One major objection to closed-captioned television to teach literacy is that the learner could rely on the audio portion of the programme rather than trying to derive the message from reading the captions. Only the most motivated learners, or those in a highly directed learning situation, would pay attention to the captions. So perhaps the most effective learning situation for utilizing closed-captioned television for literacy training would be in a community group or classroom situation, where the tutor has control of the tape via the VCR and can direct the lesson, incorporating the video in conjunction with print materials and discussion questions. Unfortunately, this may not be the most effective context for many literacy learners.

Issues and Concerns

Following receipt of additional funds from the provincial government, TVOntario is undertaking to close-caption more of its programming. In addition to captioning those programmes produced by TVOntario, some of the programmes acquired from other producers, or coproduced in conjunction with other producers, are also being captioned. The suggestion has been made by the Canadian Captioning Development Agency that TVO extend its offering of captioned programmes to learners of literacy and English/French as a second language. The research reported here set out to determine whether closed-captioned television would be an effective technology to enhance learning within these groups.

It is crucial to point out that ESL and literacy training represent two very different learning processes and require different degrees of emphasis on visual, print, and aural components. Closed-captioned television might be an effective learning tool for both literacy and ESL, however, its application would, by necessity, be different in each case. ESL programmes might use captions to reinforce the aural and visual cues, while literacy programmes would focus on the printed captions, using the audio and video components to enhance the textual material. The implementation of the same programme for both ESL and literacy learners, without intensive instructor or tutor intervention, could pose some difficulties in the learning process.

After speaking with programme providers from both the ESL and literacy sectors, it seems that TVO would be breaking new ground in Canada were it to apply closed-captioned television to the teaching of literacy and ESL. The non-broadcast application of closed-captioned television is just beginning in the U.S., and there is limited evidence of its effectiveness. While we can learn from the experiences of others and heed expert opinion, many substantive concerns remain to be addressed before TVO launches a major effort to make its captioned programmes available to adult learners of literacy and ESL. These concerns are outlined below.

1. It is necessary to assess the effectiveness of closed- captioned television and video as a learning tool in different learning contexts, i.e., at-home and in community group, classroom and library settings, and with learners of varying abilities. The types of skills which can be learned or improved using closed-captioned television should be determined as well.

2. It is also important to consider which programmes will be used to teach literacy and ESL/FSL. Both literacy and ESL experts recommend that programming be specifically developed for each of these groups. Short, self-contained video segments are considered to be effective learning units. Perhaps TVO could repackage bits of several programmes into one 20- or 30-minute tape that could be used as a learning resource for literacy and language training. Alternatively, carefully selected half-hour programs could be used, if they had been produced with a "segment" approach. Print wraparounds could be employed to introduce the programmes and suggest methods for utilization.

3. Dramatic content seems to be highly motivating for adult learners. Programmes such as la santé contagieuse, or 17, rue Laurier, which use dramatic segments to illustrate substantive points, might be well-suited to the teaching of French as a second language. Hooked on Reading also uses drama as a vehicle, however, the level of language might not be suitable for the beginning reader. The series Parents and Children and Family Matters use dramatic segments which might be suitable to literacy training. These programmes would appeal to those adults interested in obtaining information related to health and family issues. The People Patterns episode on the literacy programme "Beat the Street" would be of interest to literacy learners: the language is simple, and the individual segments can stand alone. Televised interview situations and panel discussions, i.e., "talking heads" do not easily lend themselves to this type of learning process because the visuals don't necessarily illustrate the script. Voice-overs, as used in Origines and Origins, might work well for advanced literacy students, but would not be effective for FSL/ESL learners.

4. Print materials to accompany the television programmes, designed both for at-home, independent learners and tutor-learner situations, are required. These can include a printed version of the audio script, a teacher's guide with lesson plans, a learner's workbook, and print materials related to the subject matter of the video programme. Tutor training is necessary to ensure that the programmes are used effectively.

5. The speed with which the captions appear on the screen should be adjusted to fit the reading ability of the learner. Captioning services use a standard 120 word per minute rate, and their experience has been that those viewers who find it too fast will get used to it with practice. Problems could arise when learners are discouraged at the beginning because they cannot keep up with the speed of captions. Programmes should be captioned at various speeds to accommodate different reading levels.

6. Captions should be verbatim transcriptions of the spoken script in order to be effective for learning; yet, they should not be so dense as to cause problems for beginning or mid-level readers. As well, care should be taken that the language, i. e., vocabulary and sentence structure, is not too sophisticated. Scripts might have to be simplified to accommodate the needs of these learners.

7 Captions should appear on the television screen in exact synchrony with the spoken dialogue, and they must be written in both upper and lower case letters to facilitate reading and comprehension. At present, TVO programmes are captioned in all capital letters, so that the words appear as blocks, and there is often a delay between the spoken dialogue and the appearance of the captions, causing difficulty for new readers.

RECOMMENDED PROCEDURES

The results of this research indicate a strong potential for the application of closed-captioned television to literacy and language learning. Both the experimental studies and the programme providers surveyed recommend that this technology be used as a supplementary tool, ideally geared to individual levels of competency, and in conjunction with tutor interaction and accompanying print materials. In this section, recommendations are made based on the research presented above, to guide the development and application of a learning package incorporating closed-captioned television.

Further Research

Before TVO delivers language and literacy learning packages using closed-captioned television programmes, it is important that the appropriateness and effectiveness of our captioned programmes for these purposes be evaluated. Research questions might include: Who learns best using closed-captioned television? In which contexts? Using which programmes? Captioned programmes on video should be tested on language and literacy learners of varying capacities and in different learning contexts in order to determine the most appropriate target audiences and the best learning contexts for this type of programming. The results of this research could advise decision-making as to whether the current captioned programmes are suitable in their present format, or whether and how they need to be re-captioned, re-edited, or re-packaged for use in literacy and language training programmes. Print materials directed at learners and tutors should also be tested for effectiveness, clarity, and comprehensiveness. Tutor training programmes should be developed and evaluated.

The Learning Context

In all case studies under review in this report, the need for learner and/or tutor control over programme pacing and reviewing was stressed. It is important that programmes can be manipulated, i.e., paused at any point so that learners can read what is written on the screen, ask and answer questions, refer to a printed version of captions, or rewind the tape and review the material repeatedly. VCRs are required to allow more control over the programme. As the literacy and ESL instructors unanimously recommended use of this programming in the classroom, at-home viewing is not recommended as a sole application of captions. The learners need teacher support and feedback and so the captioned programming should be part of a teaching situation. Viewing of captioned programming at home could be used as a supplement for those enrolled in classes and its usefulness investigated in that context. Home VCR penetration is also very low among the intended market for these programmes, and for these reasons, at-home viewing of broadcasts of closed-captioned television programmes is not recommended as the most effective application of this learning resource. Community- and workplace-based programmes, and

classrooms and libraries would seem to be most conducive to the application of closed-captioned video to adult learning.

Teacher Training

Other than for the most highly motivated advanced learner, closed-captioned television is probably best utilized under the close supervision of a tutor or instructor. Teacher training in the use of closed-captioned video is, therefore, required before these programmes can be implemented to teach language and/or literacy. Training sessions should incorporate hands-on demonstrations of the basic operation of a VCR and caption decoder; familiarization with captioned television and with specific captioned programmes; and discussion of possible lesson plans and sequencing. Teachers should be advised that programmes are most effective in short segments, and that in-class review of video material is often beneficial.

Learning Materials--Video

Ideally, captioned videos would be produced specifically for individual learners, composed of short video segments with clear captions and geared towards the individual's language proficiency, reading speed, and personal interests. As this seems a highly unattainable ideal, perhaps programmes could be chosen which could be easily broken down into short, dramatic segments. Two or three different captioned versions of each programme could be made, each captioned at different speeds (for beginning, intermediate, and advanced learners), and using different levels of language. These tapes could be distributed with open captions, thus obviating the need for learners and learning centres to acquire caption decoders.

Learning Materials--Print

A teacher's guide to supplement training workshops should be developed. The teacher's guide could outline sample lesson plans, indicating where teachers should stop the programme, when to ask questions and what to ask, and how to integrate print materials. A learner's workbook containing a printed text version of the captions-related print material and simple exercises should be provided. Beginning students would have difficulty following a guide on their own, and so it should be assumed that they will have tutor assistance.

Equipment

Each learning centre that is to implement closed-captioned television must be provided with a VCR and a caption decoder. If programmes are made available with open captions, caption decoders are not necessary. However, decoders will allow learners to view closed-captioned programming from other sources if they wish. For those learners who wish to view closed-captioned television programmes at home, VCRs and captioned decoders should be provided to them.

Promotion

An important component of any endeavour to offer closed-captioned programmes to adult learners is a well-directed information campaign to inform potential learners and programme providers of the availability of such a learning package. Print brochures using basic level language and pictures to describe the television programmes and accompanying materials available for at-home, classroom, or community group use on tape or over the air could be distributed through schools, community, ethnic and cultural centres, social workers, and government agencies.

The literacy and ESL communities in Ontario are served by several newsletters, and it would be worthwhile to use these media to publicize the intention to offer programming in these areas. Newsletters such as *Ontario Times, Interchange,* and *Literacy On the Move* reach teachers, learners, and programme administrators in community-, school board-, and workplace-run programmes. The Ministries of Communications and Culture and Skills Development have on-line mailing lists for these groups which can be accessed.

Public service announcements on radio and television are also useful means of reaching literacy and ESL learners, and, once literacy and language training programmes of this type become implemented within a community, word-of-mouth could be a very effective means of spreading the news about available programmes.

Conclusion

Closed-captioned television seems to hold potential for adult learning. The task now is to clarify that potential, and to develop materials and distribution systems to fulfill it. The development of an adult literacy or language training package will require a great deal of sensitivity to learner needs and should be guided by careful research. Support for these pursuits exists within the captioning and broadcast industries, as well as in the provincial government sector. If care is taken to ensure that the closed-captioned television programmes that are provided for use in adult education are appropriately designed and implemented, a valuable resource will be made available to a growing sector of the population.

FOOTNOTES

1. National Captioning Institute, Department of Research. Study 83-4, *The Hard of Hearing Market for Closed-Captioned Television,* Falls Church, June 1983.

2. Ibid., p. 3.

3. Southam, Inc. *Broken Words: The Southam Literacy Report*, 1987, p. 7.

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